15¢ SCIENCE DEPARTMENT

SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE • NOV. 1, 1947

Window in Clouds

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GENERAL SCIENCE

Science Needs Support

A compromise is needed between the President and Congress to advance science with government support via a National Science Foundation.

By WATSON DAVIS

➤ BECAUSE Congress and the President couldn't agree about how to run a National Science Foundation, the nation is without strong government support of the kind of fundamental scientific research that may decide between future abundant life and disastrous destruction of civilization.

Congress passed a bill that provided a foundation controlled by a board of two dozen part-time members, but President Truman vetoed it because he wanted it run by an administrator with an advisory board.

The next session of Congress will have the same line-up and players. There is not much hope that either side, President or Congress, will adopt the other's plan.

Scientists and the public, polls and inquiries have shown, want science to advance with government support.

They want essentially civilian direction of scientific reasearch, despite the necessary accelerated development of science for military use and the stop-gap grants being given munificently by the armed forces to universities and other laboratories.

So, Mr. President and Mr. Congressman, how about a new plan? Could you get together for the sake of the nation, on some such scheme as this:

1. For the controlling body, authorize a U. S. National Science Commission of five full-time members.

The commission form of organization is a workable, approved method of government administration, as in the Atomic Energy Commission, the Federal Trade Commission, the Federal Communications Commission, the Federal Power Commission, etc.

2. Incorporate in the new bill for a National Science Commission the salient features of the bill that passed in the last session, modified as necessary to be acceptable to both the President and Congressional leaders.

3. Invite all members of Congress to join in introducing the bill in the next session of the 80th Congress. There is excellent precedent for this unity for science. In the 75th Congress, S. 2067 "authorizing the Surgeon General of the U. S. Public Health Service to control and prevent the spread of the disease of cancer" was introduced jointly by every member of the Senate. The bill passed. Few members of the present Congress will wish to go on record "against science" in this atomic age, just as in 1937 no member of the Senate could afford to be in favor of cancer.

Mr. Truman, why not ask the Senate and House backers of the National Science Foundation bill to confer with you? This is an international emergency, as important in the long pull as filling empty human stomachs.

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Nickel was first discovered as an element in 1751 by a Swedish scientist.

WINS AWARD—Dr. Bernardo A. Houssay, of Buenos Aires, is the co-winner of the Nobel prize in medicine. He discovered the relation between the pancreas and the pituitary gland.

PHYSICS

Sound Kills Mouse

➤ SOUND too high-pitched for the human ear to hear, given out from a lantern-shaped siren developed at the Pennsylvania State College, contains enough heat energy to light a pipe, pop corn, or to kill a mouse, it is now revealed.

The device is called an ultrasonic siren. Details of its construction, together with some of the biological effects secured with it, appeared in the *Journal of the Acoustical Society* (Sept.). The report was by C. H. Allen and Dr. Isadore Rudnick who developed the siren under the direction of Dr. H. K. Schilling, director of the Penn State acoustics laboratory.

In the siren, compressed air in a small chamber escapes through 100 small holes shaped like cones and spaced equally on a six-inch circle. As air escapes, a wheel with 100 teeth chops the air into pulses. Each pulse then becomes a sound wave. When the wheel spins at 18,000 revolutions per minute, the sound has a pitch of 30,000 cycles, and is too high for the human ear to hear.

White mice placed in the sound field died after one minute of exposure. Another mouse, exposed a half minute, appeared normal eight minutes later. The following day, however, its outer ear had deteriorated. The silent siren also was found effective in killing insects. Mosquitoes died in 10 seconds but a monarch butterfly caterpillar lived 215 seconds.

Possible uses for the device include the sterilization of foods, medical treatments and surgery, treatment of seeds to increase germination, elimination of the smoke menace, and speeding up chemical reactions.

When the human hand is placed over the siren, the heating is felt at those parts of the fingers that are close together but not quite touching. Temperatures were measured with a thermocouple attached to the hand. They were also measured with the thermocouple attached to soft rubber tubing in place of the fingers. Increases as much as 45 degrees Centigrade were noted. With stiff rubber tubing the temperature increases were slight. The heating, therefore, seems to be produced by the damping of vibrations set up in the fingers by the intense sound field in the region between them.

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GENERAL SCIENCE

Nobel Prize Awarded

Two men and a woman are the winners in medicine for their researches which may pave the way to a possible conquest of diabetes.

➤ THE millions of diabetics throughout the world may well cheer the 1947 Nobel Prize award in medicine and physiology as they cheered the same award nearly a quarter of a century ago. Then (1923) it went to the discoverers of insulin, the diabetic's lifesaver. This year the award goes to two men and a woman whose fundamental researches will certainly do much to pave the way for a final conquest of diabetes, if that is ever made.

This year's Nobelists in medicine and physiology are Dr. Carl F. Cori and his wife, Dr. Gerty T. Cori, of Washington University School of Medicine, St. Louis, and Dr. Bernardo A. Houssay, of Buenos Aires.

The discovery of insulin, in 1922, brought life and health to diabetics. But, as any diabetic forced to take his insulin "shot" daily and sometimes oftener can tell you, the life-saving chemical is not a cure. And any biochemist can tell you that the discovery of insulin loosed a thousand questions to be solved.

Insulin is produced by islands of tissue in the pancreas. In diabetes, these islands stop producing the chemical. Without it a person dies. Give it to a dying diabetic and he is restored to life in a few hours. Why does it stop the drain of needed sugar from the body? How does it promote the burning of sugar in the muscles?

Solution to many questions about what happens in the body to sugar and starch eaten in food was found by the Coris. They discovered how sugar, stored in the liver as another chemical, glycogen, is converted back to sugar for transport in the blood to the muscles for reconversion there to glycogen. They also discovered that if the muscle fails to burn sugar completely the waste products are returned to the liver for conversion to glycogen.

The Coris' discovery of how insulin acts to promote burning of sugar was made following one of Dr. Houssay's discoveries. This was the relation between the pancreas and the pituitary gland. The death from diabetes which usually occurs after the pancreas with its insulin-producing islands is removed can be prevented if at the same time this tiny gland in the head is removed. While Dr. Houssay went on to show further relationships between the various glands of the body, including the thyroid and adrenals as well as the pituitary and the pancreas, the Coris kept on with their studies of sugar utilization.

The key reaction in the burning of sugar in the body is not affected by insulin, but can be completely blocked by chemicals from the pituitary or adrenal glands. Insulin, however, lifts the blockade. This discovery of where and how insulin acts has given scientists a laboratory method for testing insulin substitutes. Its importance lies in the fact that an insulin substitute is badly needed, since increasing demands for insulin may some day outrun the supply.

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NOBELISTS—Dr. Carl F. Cori and his wife, Dr. Gerty T. Cori, of Washington University School of Medicine, St. Louis.

PHYSICS

Navy Seeks New Design For Magnetic Compass

➤ THE Navy is seeking a new design for one of the oldest instruments used in navigation, the magnetic compass.

But the new compass, which scientists are working on at the Navy Material Laboratory at the New York Navy Shipyard, is a remote-reading magnetic compass which will accurately indicate directions despite heavy seas and the firing of modern guns.

During World War II, the Navy substituted remote-reading compasses for more conventional direct-reading instruments. A shortage of non-magnetic materials made it necessary to have a compass high on the mast of a ship, from which remote indicators could be read in the wheelhouse.

This system, which used aircraft compasses on the mast of the ship, was not entirely satisfactory as the roll and pitch of the ship frequently made for inaccurate readings.

Now the Navy is trying to develop a remote-reading compass which will serve effectively under the conditions of modern naval warfare. Two devices being used in tests of new compass designs are a 75-foot, non-magnetic mast and a "Scorsby," an instrument which tests vibrations under conditions of rotation and controls the earth's magnetic field in an area large enough for accurate testing.

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GENERAL SCIENCE

Why No Nazi Atomic Bomb

Germany's scientific prestige suffered because of their failure. They did not understand the difference between the atomic pile and the bomb itself.

➤ GERMANY'S scientific prestige suffered a supreme defeat when during the war German scientists, among them Otto Hahn who discovered uranium fission in December, 1938, failed to make an atomic bomb.

Now, over two years after Hiroshima, the story can be told of just what was happening under Hitler while America was achieving the bomb.

The fact is that the Germans wanted to make an atomic bomb. But they never found out how. They were working on a uranium machine or what we call an atomic pile. They didn't quite succeed in getting a self-sustaining chain reaction in the pile as Americans did in December, 1942, although they nearly did just before American troops reached Haigerloch in April, 1945.

In a colorful story of the U. S. Mission that captured German atomic scientists and apparatus, Prof. Samuel A. Goudsmit of Northwestern University (the book *ALSOS*, Schuman, $3.50) writes that the German scientists failed to understand the difference between the uranium machine they tried to build and the bomb itself. They thought the pile would be the bomb.

The German scientists did not know about plutonium, the new and heavier fissionable element made from uranium, until after the whole world knew about it with the U. S. announcements after Hiroshima.

Prof. Werner Heisenberg, leading German theoretical physicist whose contributions rank with those of Einstein, was a leader in German atomic research. Prof. Goudsmit tells how Heisenberg openly fought Nazi excesses, defended Einstein's theory of relativity which was to Hitler "Jewish" physics. But Heisenberg's "extreme nationalism led him astray during the war" and he was one of the German scientists taken into custody by the American ALSOS mission when it moved into Germany on the heels of our troops.

Prof. Heisenberg himself, in a paper which appeared in the German journal *Die Naturwissenschaften* a few weeks ago, gives his version of why the atomic bomb was not a German achievement.

"In Germany," he writes, "an attempt was made to solve the problem of the prime mover driven by nuclear energy, with an outlay of perhaps a thousandth part of the American outlay. We have often been asked why Germany made no attempt to produce atomic bombs. The simplest answer that one can give to this question is this: Because the project could not have succeeded under German war conditions."

Heisenberg tells how German industry was stretched to the limit in 1942. More importantly he says "the undertaking could not be initiated against the psychological background of the men responsible for the German war policy." The military leaders would not back anything that did not promise early results.

Prof. Goudsmit in his book blames complacency, deterioration of interest in pure science, and regimentation in the administrative control of science for the German failure. These three German errors are the principal ones that the United States can make in its further development of atomic energy if, Prof. Goudsmit warns, we are not on guard against them.

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CHEMISTRY

Heavy Carbon Atoms Are Separated by New Method

➤ AN improved method of separating the rare kind of carbon of atomic weight 13 has been devised by Dr. H. London, a young refugee scientist, working in Britain's atomic energy laboratory at Harwell.

Already the amount of this heavier carbon isotope has been increased by a quarter in ordinary carbon monoxide gas. Carbon 13 is valuable because it can be used as a tracer to discover how medical, biological and industrial processes actually operate.

Unlike radioactive carbon 14 made in the atomic pile, carbon 13 does not bombard with radiation the organism in which it is placed and thus can be used for some purposes for which the radioactive carbon is unsuited.

The improved British process consists of distilling carbon monoxide over a large area column into liquid nitrogen as a cooler.

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Hybrid forest trees, that may grow to harvesting size in one-half the time required by ordinary trees, may soon become common; already there is a hybrid pine that at three years of age is twice as large as normal pine.

A deposit of more than 8,000,000 tons of *lignite* has been discovered a few miles east of Toledo, Wash., in the center of the Pacific Northwest's wartime fuel famine area.

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METEOROLOGY

Artificial Weather Made

Pelting certain types of clouds with dry ice may lead in future to less hail damage, man-induced snow and rainfall and ice-free flying for planes.

See Front Cover

➤ WIDESPREAD man-made climate changes, particularly in the winter, may be possible with techniques now used to produce snowfall or rain from certain types of clouds.

This revolutionary prospect was disclosed by Dr. Irving Langmuir of the General Electric Company, Schenectady, N. Y., in the first official report on Project Cirrus, the joint Army Signal Corps, Office of Naval Research, Air Force and General Electric program for research into controlling weather.

Other possibilities suggested by Dr. Langmuir included:

Less severe thunderstorms.

No hail.

Man-induced snow and rainfall over mountain areas to fill reservoirs for irrigation and hydroelectric power.

Prevention of ice storms, storms of freezing rain and icing conditions in clouds.

Fewer clouds in the northern U. S. during the winter.

These are future possibilities. Already scientists on the project believe they have conquered the problem of ice formation on airplanes, the report explained, as shown on the front cover of this week's SCIENCE NEWS LETTER.

Attacking dangerous, ice - forming clouds with dry ice, perhaps in the form of bullets shot ahead of the plane, will clear a safe path through the clouds, flight experiments have proved.

A plane flying over an icing cloud should be able to clear a hole through the cloud in 15 minutes with a bombardment of dry ice, it was reported. In taking off, the plane would "seed" the lower layer of the cloud with dry ice to clear a path up through the dangerous cloud.

Attempts to change the cloud formations over an area such as the northern U. S. will have to wait for research development and experiments.

"Obviously," Dr. Langmuir pointed out, "experiments producing widespread effects should be made in relatively unpopulated regions such as Alaska or northern Canada."

Wartime smoke generators using silver iodide instead of smoke might be used on the ground for large-scale cloud changes, the scientist suggests. Use of silver iodide instead of dry ice is being studied by another General Electric scientist, Dr. Bernard Vonnegut. "Many other substances" may be found for this attack on clouds, the report predicts.

Dry ice dropped over beginning thunderstorms as soon as the tops reach freezing level can now produce less severe storms, Dr. Langmuir explains. This would also prevent hail, which claims an estimated annual damage of $15,000,000 on farm crops.

Over mountain areas, dry ice might be seeded on clouds to produce greater snowfall. This snow, which would fall as rain from the lower layers of clouds, might end the plague of dry years in irrigated valleys.

First experiments in converting a supercooled cloud to snow were in the General Electric Research Laboratory by Vincent J. Schaefer in July, 1946. Mr. Schaefer is now working with Dr. Langmuir in directing the cloud study.

In addition to the flights and laboratory experiments made, five new flights are planned to attempt various new artificial weather operations. In one experiment, the scientists will attempt to produce clouds in clear air.

Whether or not scientists are able to tailor-make weather, the cloud experiments are revealing new facts which will help meteorologists predict weather more accurately.

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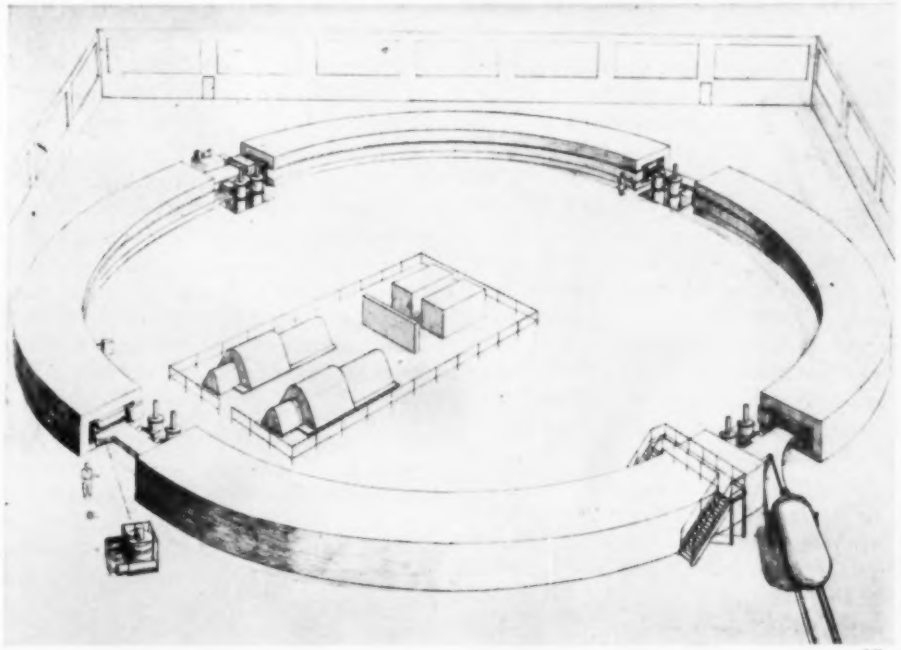
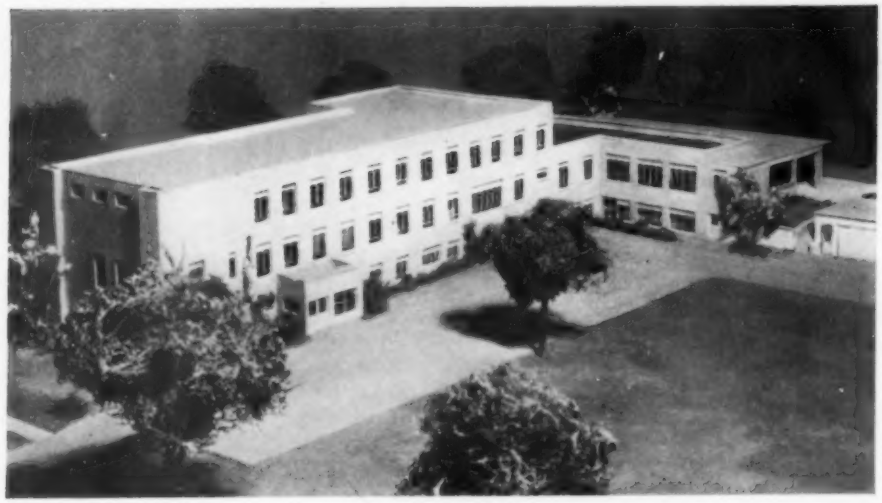
A chemical called *cylohexanone* is found to be a good solvent for DDT; it appears to irritate certain insects, making them move around more actively thus resulting in their making better contact with the DDT in the mist of the spray.

Maturity of *cotton* fiber is sometimes determined by a dyeing process; mature fiber is thick-walled, and immature fiber is thin-walled, with the result that they take up the same dyes differently.



BEVATRON—Some day this gigantic atom-smasher, plans for which are announced by Prof. E. O. Lawrence, may be built at the University of California. (See SNL, Oct. 25). It would accelerate protons, the nuclei of hydrogen atoms, to 10 billion electron volts. They are fed into it by the Van de Graaff generator shown at the lower right. The beam emerges near the man standing at the left and hits the cloud chamber generator housing in the center.



FELS RESEARCH INSTITUTE—This is a model of the structure which will house 80 new laboratories for a long-term study of the physical, mental and emotional development of human beings from conception to maturity. The building was recently dedicated.

ELECTRONICS

Earth Affects Reception

Variations in the electrical charge, or ionization, influence the wavelengths used in sending out radio broadcasts and may keep a broadcast from getting through.

➤ NEW evidence that the magnetic field of the earth causes changes in the number of electrically charged atoms in the highest layer of the earth's atmosphere, 250 miles up and of importance in sending and receiving radio broadcasts, has been advanced.

These changes are due both to energy from the sun and that obtained from here on earth, T. N. Gautier of the National Bureau of Standards stated at the joint meeting in Washington of the International Scientific Radio Union, American Section, and the Institute of Radio Engineers.

Variations in the electrical charge, or ionization, influence the wavelength used in sending out radio broadcasts. Sudden changes sometimes keep a broadcast from getting through.

In the lower layers of the atmosphere, 75 miles or so above the earth, there is only a slight day-to-day fluctuation at a given place. But in the highest layer this fluctuation averages 10%. Changes as great as 30%, 40% and even 50% have been noted.

Because of local variations, it is not feasible to use conditions recorded at one place for making day-to-day forecasts of radio conditions in another, distant region.

At Washington and San Francisco, ionization of atoms in this highest layer tends to increase and decrease at the same time. But near the equator, ionization at Huancayo, Peru, for instance, may increase while it is decreasing at Christmas Island in Polynesia. The local cause of these variations is therefore probably geomagnetic, Mr. Gautier stated.

The total eclipse of the sun last May gave astronomers an opportunity to compute how fast ions in the upper air recombine. The cutting off and restoring of light during the eclipse was, for research purposes, actually a rapid sunset and sunrise, A. H. Shapley of the National Bureau of Standards told the meeting.

Atoms in the highest layer of the earth's atmosphere were not as much affected as was expected, he pointed out, whereas the density of electrons in the layer 75 miles up, dropped to about 37% of its usual density. At nighttime this ionization goes down even more.

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GENERAL SCIENCE

Fels Research Institute Dedicates New Laboratory

➤ WHEN the mother of an unborn baby smokes, the baby's heart beats faster.

At least one out of seven babies examined hiccup before birth; this may be due to lack of oxygen.

Babies that move around a lot before birth have the highest scores on baby tests after birth.

These and many other facts about the development of babies and older children are being gathered at Yellow Springs, Ohio, in a long-range research program of the Fels Research Institute for the Study of Human Development under the direction of Dr. Lester W. Sontag. A new laboratory of 80 rooms devoted to this research was dedicated in October.

A group of 130 children are being studied from about four or five months before birth until they are well into their teens. The study has now been going on for 18 years, although the number of children under observation has increased from less than 20 in the first year to the present 130.

Among the many factors of growth and the influences on growth being observed are: bone development as shown by X-ray, growth in size, nutrition, blood pressure, heart rate, allergies, illnesses, accidents, emotional adjustment, and mental development.

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PSYCHOLOGY

Loss of Strength After 25 Indicated by Tests

➤ YOU begin to lose your strength at the age of 25. That is when "old age" sets in, it appears from measurements of hand strength made on 552 men industrial workers by Dr. M. Bruce Fisher, of Fresno State College, California, and Dr. James E. Birren, of the U. S. Public Health Service when both were on duty at the Naval Medical Center, Bethesda, Md. (*Journal of Applied Psychology, Oct.*)

Strength increases up to the middle twenties, these tests show, and then goes steadily down. By the age of 60, the average loss of strength amounts to 16.5%. There is, however, considerable overlapping among different age groups.

Lack of exercise cannot be the explanation for the loss, the investigators feel, because all the men were actively engaged in the same sort of work.

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MEDICINE

Filariasis Under Attack

Progress with four chemical compounds is being made against this tropical disease which attacked service men in the South Pacific and causes elephantiasis.

➤ PROGRESS in chemical warfare against a disease affecting hundreds of millions of persons, though it seldom causes an epidemic, was announced at meetings at the New York Academy of Sciences in New York.

The disease is filariasis. It is a tropical disease which attacked some of our fighting men in the South Pacific and caused grave concern to many more because of the elephantiasis which is a late result in untreated cases.

Until recently, hardly any chemical tried against it succeeded as a remedy. The disease is caused by a kind of worm and is spread by mosquitoes.

Today, four kinds of chemical compounds show promise of leading to conquest of filariasis. The four are: new antimony compounds (antimony has long been the stand-by for treatment of the disease); arsenical compounds; cyanine dyes; and piperazines.

One of these piperazines, called hetrazan for short, was given to 26 filariasis patients in Puerto Rico, Dr. J. Oliver-Gonzalez of the School of Tropical Medicine, Puerto Rico, reported.

They got the drug by mouth three times a day. In all cases the number of baby or embryonic worms, called microfilariae, in their blood was markedly reduced in two days. In nine of the 26 none could be found at this stage of treatment. In 11, tests 30 to 150 days after treatment, which was given from three to 22 days, no microfilariae could be found. In the remaining 15 all but one had reductions of 85% or more from the original count of microfilariae. Nine patients followed for four to five months have shown no recurrences.

Even in those who did not get to zero in the count of microfilariae in their blood, the number was so reduced that mosquitoes could not become infected. This is of great importance, Dr. Oliver-Gonzalez pointed out, in considering the usefulness of the drug.

Safety of the drug was reported by Dr. D. Santiago-Stevenson. Patients had no severe reactions though some developed fever during the first two days.

The drug may also kill the grown-up worms, believed responsible for blocking the lymph channels and causing the grotesque and often horrible swelling of elephantiasis. Evidence for this in the patients was reported by Dr. Santiago-Stevenson and also in laboratory studies on cotton rats and dogs treated by Drs. R. I. Hewitt, D. E. White, S. Kushner, W. S. Wallace,. H. W. Stewart and Y. Subbarow of Lederle Laboratories, Pearl River, N. Y., where the drug is made.

Cyanine dyes are now also being tried on patients in Puerto Rico, Dr. L. Peters of Western Reserve University, Cleveland, reported. These dyes are prepared by Dr. L. G. S. Brooker of Eastman Kodak Research Laboratories. Tests on rats and dogs by Dr. Peters and Dr. E. Bueding at Western Reserve and by Dr. J. T. Litchfield and associates at the University of Minnesota show the dyes to be effective in animals. They have to be given by injection into the veins to get the best results .

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PHYSICS

Shock-Absorbing Liquid Found Among Silicones

➤ SPRINGY liquids capable of use as a new type of shock-absorber have been discovered among the novel forms of matter known as silicones. This unusual property was detected by measurement of inaudible sound in the new fluids, which are already famous for their resistance to extremes of temperatures.

Properties of silicones, which are near relatives of both the rocks of the earth and the plastics of industry, were discussed at the high polymer forum of the American Chemical Society meeting in New York. Dr. Alfred Weissler of the U. S. Naval Research Laboratory told how ultrasonic waves measured by a new method in the silicone liquids can be used to determine the weight of these giant molecules. Their unusually high compressibility was discovered during these determinations.

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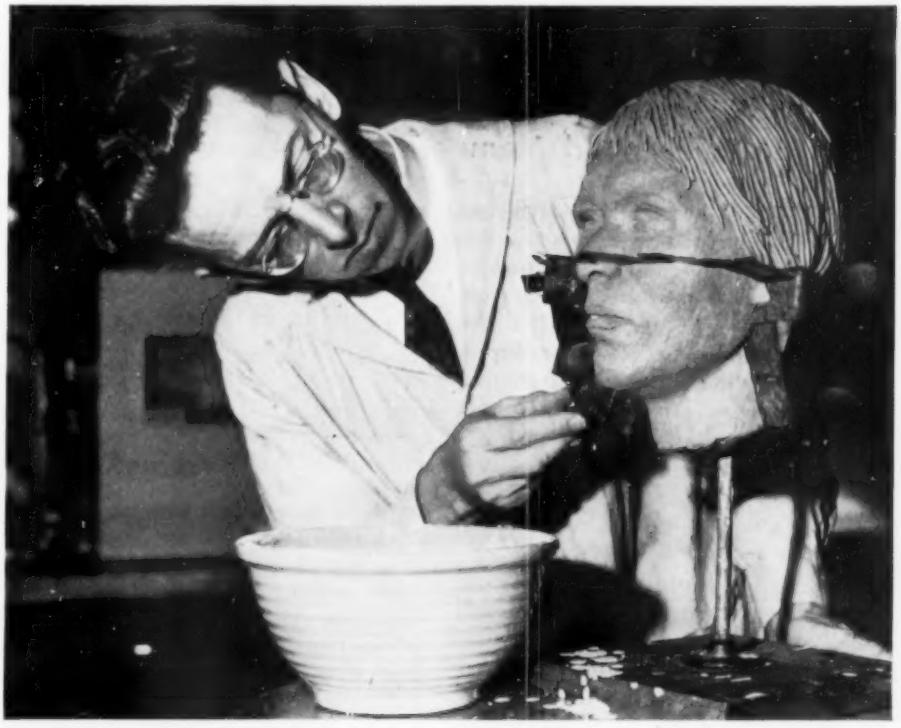

TEPEXPAN MAN—Found recently in a Mexican lake-bed dating some 10,000 to 15,000 years ago. (See SNL, July 5). His bones were brought from the Mexican National Museum to the Smithsonian Institution in Washington and there reconstructed. A. Joseph Andrews is making a cast of the head which the museum hopes to send to the United Nations Scientific Meeting in Mexico.

BIOLOGY

Penicillin Kills Germs In Microscopic Animals

➤ PENICILLIN kills bacteria not only in man and the larger animals but in animals too small to see without a microscope. This discovery is announced by Gerald R. Seaman of Fordham University. (*Science*, Oct. 3).

The microscopic animals, belonging to the order Protozoa, are not necessarily sick because they have bacteria in them. The bacteria are just there, as many harmless bacteria are "just there" inside ourselves. Some kinds of protozoa even devour bacteria as the main part of their diet.

However, it is sometimes desirable to have the little animals in a germ-free condition so that results of experiments with them will not be messed up by the presence of the bacteria with their own biological processes.

Protozoa cannot stand being kept too long in the bacteria-killing bath of penicillin solution, the Fordham zoologist states. One lot that he tried were still swimming around vigorously after five hours but were dead at the end of 12 hours.

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NUTRITION

Ten Foods Listed as Base for Year-Round Menu

➤ HARASSED homemakers, trying to balance food budgets without sacrificing the family's health, would do well to adopt the following as the backbone of their year-round menu planning:

White potatoes, whole-wheat bread, rolled oats, beef and pig liver, pea beans, rutabagas, carrots by the pound, spinach, and milk, fresh or canned.

This is the conclusion of a two-year study made in Ithaca markets by Mabel Rollins, associate professor of home economics at Cornell University.

Miss Rollins priced 107 foods at two-week intervals in seven stores. She found those mentioned practically always available with relatively small price fluctuations, and were comparatively inexpensive in relation to dietary essentials contained.

At other seasons, other foods would qualify for the "cheap and nourishing" list, she says. Among cheap and nourishing foods at this season are Hubbard squash, sweet potatoes, and green cabbage. She also advises that housewives could do worse than cultivate a taste for kidneys (beef, calf and lamb).

The study took into consideration the fact that many foods have much higher percentage of waste than others, as well as the amount of dietary essentials.

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PUBLIC HEALTH

Possible to Vaccinate All Egyptians Against Cholera

➤ EGYPT'S entire population could be vaccinated against cholera within one month, half of it within a few days, Dr. Brock Chisholm of the World Health Organization's interim committee estimated.

His estimate was based on figures for cholera vaccine production, which went into high gear to meet the emergency. Enough to vaccinate 750,000 people was sent by air Oct. 25. Another, slightly larger amount was ready within another week, and if the need continues, production can go to three times that amount per week.

Cholera cases, now officially tallied at 4,785 and unofficially estimated at well over 5,000, are expected to continue increasing for a short time. But there are already signs that the epidemic is levelling off. A precipitous drop should start soon, as more and more people are vaccinated and other control measures become increasingly effective.

Never before in history, Dr. Chisholm said, has a cholera epidemic that started up as swiftly as this one been stopped at anywhere near this level. Egyptian health authorities have "done a truly remarkable job in checking the spread of the disease," he declared, adding that there has also probably never before been such international cooperation.

A virtual "freezing" of Egypt's population is considered one of the important measures that helped check the spread of the disease. The epidemic started at El Karim with five cases on Sept. 22. Two days later the prime minister advised military cordons around the infected areas to stop all but necessary official travel into and out of them. The cases have still been largely confined to rural areas.

All pilgrimages to Mecca were stopped, but the first group had already gotten off. No case of cholera among Mecca pilgrims or anywhere else that could be traced to the Egyptian epidemic has occurred, so far as WHO information goes.

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IN SCIENCE

AERONAUTICS

Floating Seaplane Berth Makes Landings Easy

➤ THE Navy has a new self-propelled floating seaplane berth which will make landings from flying boats easy. The aircraft anchors in waters off-shore and the berth is swung to its side.

The berth is built of pontoons and operates on a 600-foot submerged cable. It can be swung in any direction to permit a plane to taxi on the water into the wind while entering or leaving the slip. As a result the pilot is relieved of the task of maneuvering a large flying boat to a dock or mooring buoy, a difficult job in high winds or choppy seas.

The mooring of the plane in the movable berth is further simplified by the slip's bell-mouthed entrance and by a system of water jets, three on each side of the entrance, which push the plane from one side of the slip to the other. Partially-filled airplane tires along the two inner sides of the berth prevent damage to the airplane on contact.

Science News Letter, November 1, 1947

METEOROLOGY-AERONAUTICS

New Portable Instrument Measures Low Wind Velocity

➤ WIND speed and direction are accurately indicated by a new portable instrument of high sensitivity just revealed by the National Bureau of Standards, where it was developed. It is designed particularly for use in take-off tests at landing fields.

The instrument is mounted on a sturdy tripod like a surveyor's transit and can be leveled in the same way. Wind velocity is measured by means of a propeller forced to head into the wind by a vane. Its speed is registered on a magnetic tachometer, while its direction is indicated at the same time on a circular horizontal scale by a needle connected to the shaft of the vane.

One feature of the new instrument, developed by S. H. J. Womack and F. Cordero of the Bureau staff, is that it can be used to measure very low wind velocities. Previous instruments were not suitable for use in take-off tests.

Science News Letter, November 1, 1947

E FIELDS

MEDICINE

Crippled Polio Victims Increase in Recent Years

➤ THE number of children and young people in the United States crippled by polio has increased almost 45% in the past seven years. It has risen 100% in the last two years, reports to the U. S. Children's Bureau show.

This is what might be expected since we have just passed through the longest period (1943 through 1946) of sustained high numbers of cases of the disease in the history of the country.

Nearly 74,000 persons under 21 years of age were crippled to some degree by the disease as of Jan. 1 of this year, statisticians of the Metropolitan Life Insurance Company point out. At the beginning of 1940 the number was in the neighborhood of 51,000. Only a small part of this rise is due to an increase in the number of children in this country.

Children are the chief victims of poliomyelitis, which nevertheless attacks persons of all ages. It is responsible for one-fifth of all orthopedic handicaps of boys and girls under 21.

The largest increase in crippled survivors was recorded by Utah, which showed a rise of 230%. Other states in which the rate at least doubled during this period were Arkansas, Colorado, Ohio, Tennessee and Indiana.

Science News Letter, November 1, 1947

GENERAL SCIENCE

Science Magazine Tries To Fill Nazi-Caused Gaps

➤ TO FILL up the great gaps in scientific knowledge caused by Nazi perversion of education is first objective of a small group of German science writers who have established their publication center at the town of Murnau, near Munich. They issue a monthly popular science magazine under the starry name of *Orion*, and have also begun to publish pocket-size, paper-bound books.

"Our objective is two-fold," states one of the editors. "First, we wish to lay a foundation of knowledge, especially for the young people, who in the years of Hitlerism and the war learned less and less year by year and now show terrible gaps in their education. But the grown-ups, too, have altogether too little knowledge, and the little that they know has often been distorted and falsified in the worst possible way under the Nazis.

"Second, with this foundation laid, we wish to give our readers the materials which they need to create for themselves a correct picture of a world in which many new things are constantly developing."

Editor-in-chief of the new venture is an engineer, Erich Lasswitz, who for 25 years conducted the science page of the Frankfurter Zeitung, one of Germany's most progressive newspapers. Goebbels had him thrown out of his job and threatened him with the concentration camp. The other editors are younger men who, however, were already well educated before Hitler came to power.

The tale of their present troubles has a familiar sound to any American editor: inadequate working space, difficulty in finding people who can write good copy, and above all the everlasting shortage of print paper. They say they could double their circulation overnight if they could get the paper on which to print.

Science News Letter, November 1, 1947

ORNITHOLOGY

Many Records Listed Of Torpidity in Birds

➤ DO birds hibernate?

Usual answer to that question, from biologists, is an emphatic "No." Some doubt is cast on this confidently positive denial by W. L. McAtee, veteran naturalist of the U. S. Fish and Wildlife Service.

On two different occasions, he states, he has found chimney swifts in a torpid, almost death-like state, late in the season after other birds of this species had flown south for the winter. Warmed up and released, they flew away. Through correspondence with other competent scientists, he learned of further instances of the same kind.

That set him to searching ornithological publications for as many recorded cases as he could find. In the *American Midland Naturalist* (July) he gives an annotated list of 152 titles of articles and books in which mention is made of this phenomenon. Some of them, especially the older ones, are akin to the ancient Greek's belief that swallows do not migrate but spend the winter in the mud of pond bottoms; but many are records of observations like his own, by scientifically trained persons.

Science News Letter, November 1, 1947

MEDICINE

Polio Virus Discovered In Blood of Patient

➤ A RARE discovery, the finding of infantile paralysis virus in human blood, is reported by Drs. Hilary Koprowski and Thomas Norton of Lederle Laboratories and Dr. Walsh McDermott of Cornell University Medical College and the New York Hospital in the U. S. Public Health Service's official journal, *Public Health Reports* (Oct. 10).

The presence of the polio virus has only once before been found in human blood and only rarely, in spite of many attempts, has it been found in monkeys experimentally infected.

The virus in the New York Hospital case was found in the course of efforts to determine the cause of a mild illness in a 29-year-old-man. The symptoms suggested a virus infection of some kind involving the central nervous system. Polio was suspected, but the infection could have been some other virus.

Polio virus normally travels along nerve pathways to attack nerve cells in the spinal cord and brain. It is apparently only in a very occasional case that it gets into the blood.

Science News Letter, November 1, 1947

CHEMISTRY

New Sand Fluid Improves Rubber, Paper and Leather

➤ A SAND dressing to add strength and better wearing qualities to rubber, leather, paper and other materials was revealed by the du Pont Company, Wilmington, Del. It is a fluid containing extremely finely divided particles of silica, most familiar as common sand, and has "Ludox" as a trade name.

This new product, essentially salt- and sodium-free, is highly fluid even in a concentrated form. On drying it yields substantially pure silica in the form of thin films or finely divided particles which can not be re-dissolved in water. When examined by means of the electron microscope these dried particles are found to be less than a millionth of an inch in diameter.

Ludox affords a means of modifying many other materials to utilize the inherent properties of silica. These include mechanical strength, resistance to atmosphere and chemical agents, and resistance to heat. It will have many applications in industrial processes in addition to those mentioned.

Science News Letter, November 1, 1947

GENERAL SCIENCE

Young Scientists Sought

In order to help solve the problem of the critical shortage of scientific manpower in this country, the spotlight is again turned on scientists of tomorrow.

By RON ROSS

➤ HERE are some of the products of a unique scientific experiment:

Nuclear physicist who is helping build a cyclotron. Sulfa drug experimenter. Two young women scientists helping produce better hosiery and other nylon products. Medical student teaching nurses as he works toward his M.D. Chemist making technical studies of synthetic rubber product.

These are some of the young scientists discovered in a scientific experiment. Unlike a new material, they were not poured from test tubes. They were discovered in a scientific hunt for science talent among high school seniors in this country. This experiment in selecting future scientists is called the Science Talent Search.

Each year since 1942, Science Clubs of America, administered by Science Service, has conducted this competition to turn the spotlight on scientists of tomorrow in the senior classes of American high schools. The Seventh Annual Science Talent Search for the Westinghouse Science Scholarships is already underway.

Examination in December

Throughout the country, thousands of science-minded young people have been studying and conducting research which they will enter in this year's Science Talent Search. Formal examinations will be given in December, but the winners are already completing the projects which will win them college scholarships.

For the top boy and top girl among this year's 40 winners from public, private and parochial high schools there will be Westinghouse Grand Science Scholarships of $2,400, made available by the Westinghouse Educational Foundation. Cooperation of two scientific organizations, Science Service and the Westinghouse Electric Corporation, make the search possible.

The Science Talent Search is a project to help solve the problem of scientific manpower, one of the most critical shortages in this country. Cancer, polio, the common cold and a thousand other urgent problems, all must be solved with scientists as well as laboratories, chemicals and instruments. New products for better living must be developed and produced by scientists and technically trained men and women. Most precious resources of our great laboratories are the minds of scientists. Above all, there must be the slow patient accumulation of basic new knowledge on which the future applications of science are based.

Long Training Period

But there are no labor-saving, time-conserving devices for producing scientists. They must be found and trained for many years before they can turn out new weapons against disease and new developments to benefit us all. The Science Talent Search is proving its worth as a means of spotting those young scientists who will be the research leaders of tomorrow. It was designed to seek out scientifically the outstanding prospective research scientists while they are still seniors in high school.

Despite the interference of war service, a survey shows that the young winners in the first two Science Talent Searches are already well ahead in science, just five or six years after they left high school. Let us look at a few of them.

Clifford Swartz of Niagara Falls, N.Y., boasts two college degrees and is working toward a third. He is one of the atomic scientists of tomorrow. At the University of Rochester where he is studying nuclear physics he is helping to build the new cyclotron under construction there.

Working toward an advanced degree in biochemistry at the University of Michigan is Evelyn Pease of Evansville, Ind. She has spent several summers working in her home town on new sulfa drugs with Mead, Johnson and Co.

Mary Ann Williams, Kingston, N. Y., worked at the Nylon Control Laboratories of the Du Pont Experimental Station before returning to Cornell University, where she is doing advanced degree research studies in biochemistry.

Another nylon chemist is Julia Anne Wien of Esterly, Pa. She is studying the problem of color-fast nylon hosiery as a chemist with the Berkshire Knitting Mills, Wyomissing, Pa.

Top boy winner in the first Science Talent Search in 1942, Paul Teschan of Shorewood, Wis., is completing his M. D. degree at the University of Minnesota, where he also has taught nurses.

Working toward an advanced degree in chemistry at Cornell University is Wolf Karo, Utica, N. Y. His is the problem of measuring the rate of decomposition of certain catalysts used in making synthetic rubber.

These young scientists are typical of the Science Talent Search winners who have begun carving careers in science for themselves in less than half a dozen years since they were discovered as high school seniors.

Mrs. Gloria Lauer Grace, reared in Ames, Ia., has earned her Ph.D. degree in psychology in four school years, the time normally required to earn a bachelor's degree. Now married to a scientist, Mrs. Grace is teaching at Barnard

OBSERVING SUNSPOTS—Elizabeth Roemer's astronomical readings at the University of California at Berkeley are sent to the National Bureau of Standards where they are used to help forecast radio conditions.

TESTING RESPONSES—Mrs. Gloria Lauer Grace examines a boy at Columbia University while a group of his schoolmates crowd around.

College and has studied the learning responses of New York school children during her work at Columbia University.

A German refugee boy when he won a $2,400 Westinghouse Grand Science Scholarship, Raymond R. Schiff of New Rochelle, N. Y., wrote an essay on the future of atomic energy. After studying nuclear physics at Harvard, he is now doing atomic experimental work at the Westinghouse Research Laboratories before returning to college.

Winners in Many Fields

The fields of science in which Talent Search winners may be found is broad. Some study the science of the things around them. Others, like Elizabeth Roemer of Alameda, Calif., look to the heavens. Miss Roemer, a winner last year, makes daily sunspot observations which help predict how well your radio will pick up distant broadcasts.

The effectiveness of the cooperation of industry with education in making available opportunities to the scientists of the future is demonstrated by the sponsorship of the Science Talent Search by the Westinghouse Electric Corporation through its Educational Foundation. This industry participates in this educational effort in much the same spirit that it supports fundamental science investigations in its research laboratories—confident that even if the new knowledge gained or the young scientists discovered do not work for Westinghouse, that organization will have helped advance the world's progress.

The Seventh Annual Science Talent Search will spotlight more young scientists of tomorrow who will graduate from high school in 1948. The Search is already on.

Entrant's Qualifications

Each student will submit his school record and recommendations, complete a three-hour science aptitude examination and report his own work in science in an essay, "My Scientific Project." Examinations will be given in the entrant's own high school on or after December 1.

From approximately 16,000 entries, 300 will be selected for honors. Of this group, 40 will come to Washington late in the winter as winners of the Seventh Annual Science Talent Search. The other 260 named for Honorable Mention will receive recommendations for scholarships to the colleges of their choice.

In Washington, at the Science Talent Institute, winners meet leading scientists, hear of new developments in science and visit important laboratories.

High school seniors working on scientific projects will be winners of this year's Science Talent Search. Ahead of them lie an exciting competition, honors, fame, education and a career in science which will add new proof that the Science Talent Search experiment can help find tomorrow's scientists today.

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5—Comparative size of the star Betelgeuse to the orbits of the planets.
6—Sectional view thru the earth showing the pressure at earth's core, etc.
7—Twenty of the brightest stars and their distances.
8—Our solar system in a nut shell. Shows our relative distance to other stars.
9—Our location in the Milky Way Galaxy, and time to reach nearest star.
10—Curvature of the earth with comparative heights and depths.
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(Please Mention SCIENCE NEWS LETTER)

Do You Know?

The *chemical industry* is sometimes divided into heavy, fine and organic chemicals; a heavy chemical, as the term is used applying to an industry, is one that is made and used in large quantities.

Cottonwood, balsam poplar and basswood are light-colored woods with which *aspen* lumber is often confused; the heartwood of aspen is white, while that of the others varies from a pale gray to a grayish brown.

Not many *airplanes* are designed to carry a load greater than their own weight; the Northrop Flying Wing, now under test, will be able to carry 120,000 pounds, it is claimed, in addition to its own 89,000 pounds.

A large manufacturing plant near Pittsburgh is drilling for *natural gas* on its own grounds in hopes of getting supplementary fuel in case of future fuel shortages.

Automobile engines, not perfect in combustion, produce from 1% to 13% carbon monoxide in their exhaust gases, recent tests show.

PHOTOGRAPHY

Speed up Movie Shots

Five million pictures a second can be snapped with a new perfected motion picture camera. This is claimed to be ten times as fast as any produced before.

➤ FIVE million pictures a second is the speed of a new motion picture camera. This is claimed to be 10 times faster than any high-speed camera produced before. When its picture of a rifle bullet is thrown on a screen at ordinary speed it takes a minute for the bullet to move one inch.

The new camera, developed at the University of Rochester's Institute of Optics, was revealed in New York to a group of scientists by Dr. Brian O'Brien and Gordon G. Milne, who are responsible for its development. An earlier version was used at the Bikini atomic bomb test, but it was a type that produced a continuous streak instead of an interrupted series of pictures.

The methods used to get this exceedingly high speed limit the quality of the pictures produced. They are far below ordinary motion picture standards, but serve for research and industry.

A film in a conventional type camera would have to travel 20 to 50 times the velocity of a bullet to get several million frames a second. If the film is stationary and the image caused to move by rotating mirrors, the total number of frames, and thus the total duration of the motion picture, is quite limited. These difficulties are overcome in the new camera by a device which dissects the image, which later has to be reassembled.

The dissecting device breaks up the image of the rectangular picture into a series of very narrow strips which are drawn out by the film, which travels at a rate of 400 feet per second, into a streak. The variations in the photographic density at any particular place across this streak contain all the elements of a complete rectangular picture.

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Science News Letter, November 1, 1947

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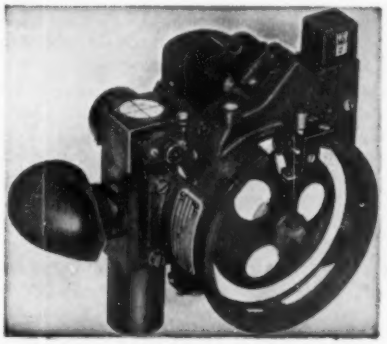

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AMPHIBIANS AND REPTILES OF THE PACIFIC STATES—Gayle Pickwell—*Stanford U. Press,* 236 p., illus., $4.00. Reptiles and amphibians of Washington, Oregon, and California are described thoroughly, and information on their life history, as well as their collection, care and handling, is included.

ANNUAL ENGINEERING UNDERGRADUATE AWARD AND SCHOLARSHIP PROGRAM—Free from: James F. Lincoln Arc Welding Foundation, Cleveland, Ohio. A statement of rules and conditions of the contest.

CACHE LAKE COUNTRY: Life in the North Woods—John J. Rowlands—*Norton,* 272 p., illus., $3.50. This story of life in the North Woods through twelve months of a year contains valuable information on nature and woodcraft, and is enhanced by numerous drawings.

THE CHEMISTRY OF ORGANIC COMPOUNDS—James Bryant Conant and Albert Harold Blatt—*Macmillan,* 3rd ed., 665 p., illus., $5.00. The authors have introduced new physicochemical concepts and data without disarranging material included in earlier editions.

COUNTRIES OF THE CARIBBEAN—*National Geographic Soc.,* 50 cents. The most recent in the series of maps of important areas of the world, made with the knowledge gained from wartime flights over the region. Available from: Sixteenth and M Sts., N. W., Washington, D. C.

CONVECTION PATTERNS IN THE ATMOSPHERE AND OCEAN—R. B. Montgomery et al.—*N. Y. Academy of Sciences,* Annals, Vol. XLVIII, Art. 8, 140 p., illus., paper, $2.00. This monograph deals with several aspects of a field that has received little attention despite its importance to man's environment.

DECENTRALIZE FOR LIBERTY — Thomas Hewes—*Dutton,* 238 p., $3.00. The author sets forth in detail his view that, in order to achieve each citizen's maximum productive capacity, the United States must undergo a full decentralization—social, economic, and governmental, in physical plant, population, and individual responsibility.

DIABETES AND THE DIABETIC IN THE COMMUNITY—Mary E. Tangney—*Saunders,* 259 p., $2.75. This practical manual covers numerous phases of diabetes, offering guides to both diabetic nursing and the means of teaching the diabetic person to live in the community.

FLAMEPROOFING TEXTILE FABRICS—Robert W. Little, ed.—*Reinhold,* American Chemical Society Monograph Series No. 104, 410 p., illus., $6.75. A number of specialists have joined in presenting various phases of the wartime experiences in decreasing flammability of various military fabrics.

FREE MATERIALS FOR SCHOOLS: Their Significance and Source—Educators Progress Service—1 yr.: $17.50; 3 yrs.: $27.00 on 30-day billing, $28.50 on 90-day billing, $31.50 total for three annual payments. A guide to materials available free for the enrichment of school curricula, such as maps, bulletins, exhibits, books, magazines, radio scripts, etc., set up by topics in card-index form, and packaged in a metal case.

GENERA FILICUM—Edwin Bingham Copeland—*Chronica Botanica,* Annales Cryptogamici et Phytopathologici, Vol. V., 247 p., illus., $6.00. An up-to-date presentation of the taxonomy of ferns.

HANDBOOK OF PSYCHIATRY—Winfred Overholser and Winifred V. Richmond—*Lippincott,* 252 p., $4.00. In language readily understandable to the layman, the authors describe the various types of mental disease, their symptoms, causes, and prognoses, with some general reference to therapy.

HORTICULTURE AND HORTICULTURISTS IN EARLY TEXAS—Samuel Wood Geiser—*South. Meth. Univ. Press,* 100 p., paper, $1.00; cloth, $1.50. Describes fruit culture in early Texas for the period chosen and also contains information concerning early horticultural societies and journals; a section is devoted to brief biographies of Texas horticulturists.

TRUSTEE—*American Hospital Assn.,* Vol. I., No. 1, $3.00 per year. The first issue of a new journal for and about hospital governing boards. Available from: 18 E. Division St., Chicago 10, Ill.

Science News Letter, November 1, 1947

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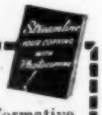

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AERONAUTICS

Racon Lets Pilot Know His Position at All Times

➤ PLANES on the new transcontinental Racon-route, which is nearly completed, will be able to determine their exact positions at all times by means of 50 Racon stations along the Atlantic coast, across the south, and north along the Pacific.

The installation is jointly by the Navy, Air Force and the Coast Guard. It provides the United States with its first transcontinental radar airway. The route followed is generally used by military planes and, while the installation is primarily for such craft, it will be available for commercial transports.

Racon is a war development. The word is coined from radar and beacon. It is a system of short-range aerial navigation. The traveling plane sends out radar impulse which "trigger" the land-based station. The station responds in its identification code. This code appears on the radar scope or screen on the plane, from which the bearing and distance from the plane to the beacon can be read.

Racon airways have several advantages over ordinary radio-range routes. The principal one is that the pilot knows his position at all times. With the radio range he knows his direction only when directly "on the beam," and his location only when directly over a station or a radio marker.

Of the 50 stations on this route, the Navy will operate 22, the Air Force 14 and the Coast Guard 14. Additional Racon-routes are planned for the future, the next probably to be from Chicago to Seattle.

Science News Letter, November 1, 1947

Flax for *home fiber* was an early American colonial crop.

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❁ *SUNLAMP, designed to be folded away under the bed when not in use has built-in automatic timer which turns the lamp off when the desired length of exposure has been reached. With it, persons in bed can take ultraviolet ray treatment without danger of overexposure.*

Science News Letter, November 1, 1947

❁ *VALVE REGULATOR, a plastic device to hold an inverted bottle of liquid floor wax on the front of a waxing mop and release liquid as needed, is operated by tipping the mop handle forward until the projecting top of the valve touches the floor. No wax leaks when the mop is held in working position.*

Science News Letter, November 1, 1947

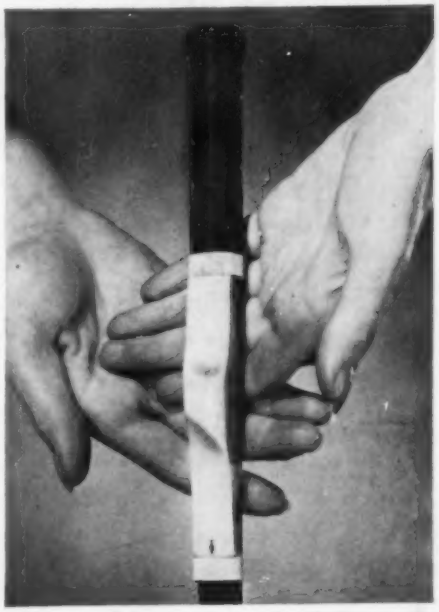
❁ *SAVINGS BANK for children is an upright coin-size tube, standing on a supporting base, with a slot near the top through which the money is pushed. A movable arm on the tube enables one to determine when the height of the pile of coins is on a level with the top of the head of the child.*

Science News Letter, November 1, 1947

❁ *IMPROVED WASHING machine for automobiles, with seven giant-sized rotary power brushes with long fibers, and compressed air for drying, does a complete car-washing job in 90 seconds, it is claimed. The brushes are arranged to scrub all parts of the car at the same time.*

Science News Letter, November 1, 1947

❁ *GRIP FINDER for the golf club,*



shown in the picture, is a plastic attachment held in place with adhesive tape. Molded with two impressions, it lines up both thumbs and keeps the hands together for firmer grip.

Science News Letter, November 1, 1947

❁ *BROKEN LINE DEVICE, recently patented, for draftsmen who have constant occasion to draw lines composed of a series of short dashes, consists of a pencil-carrying carriage and a straightedge. A cam in the carriage lifts the pencil point from contact with the paper at regular intervals.*

Science News Letter, November 1, 1947

❁ *TRANSFORMERS for photographers, designed especially for photoflash use, are of two types, one for use from 110-volt lines and one for use with four or six-volt batteries. They provide a 2,200-volt direct current output and both are sealed in steel cases.*

Science News Letter, November 1, 1947

❁ *SHOE POLISH APPLIER has a hollow lengthwise cavity in its center to hold the paste and mechanical means by which a little may be ejected to a small brush on the front lower side of the device. The rest of the lower side is covered with a material for polishing.*

Science News Letter, November 1, 1947

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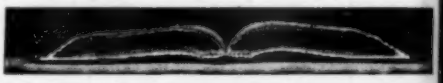

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